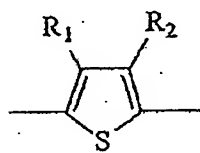
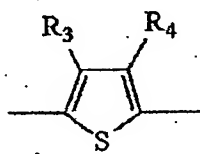


## CLAIMS

1. A  $\pi$ -conjugated compound which has two or more rings represented by Formula (I) and two or more rings represented by Formula (II), an odd number of rings being interposed between the rings of Formula (I), and an odd number of rings being interposed between the rings of Formula (II):



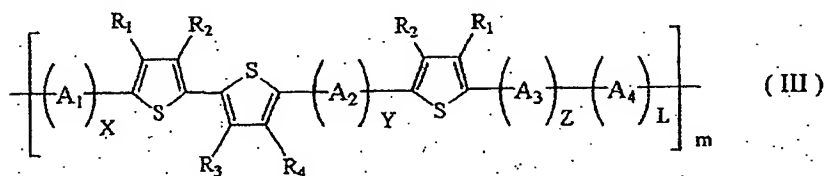
(I)



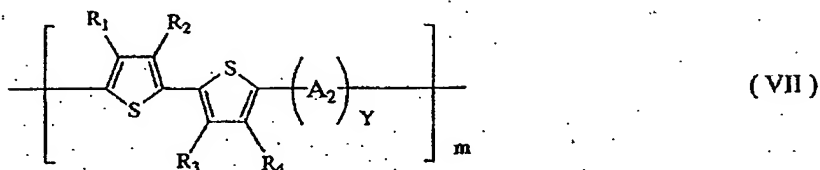
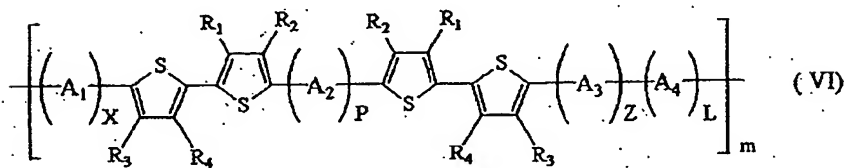
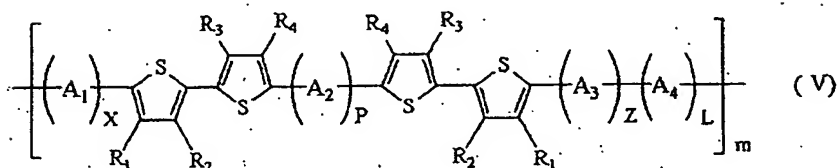
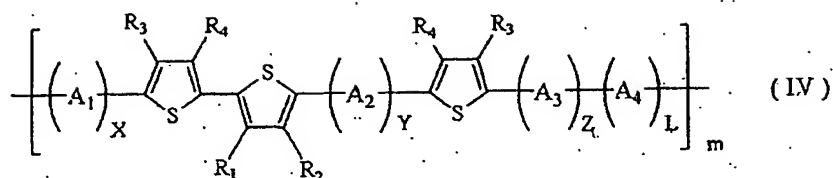
(II)

- where  $R_1$  and  $R_2$  are respectively hydrogen or a linear, cyclic, or branched alkyl group of 1 to 20 carbon atoms, at least one of  $R_1$  and  $R_2$  being not hydrogen, and  $\text{CH}_2$  of the alkyl group may be replaced by O, CO, S, or NH; and  $R_3$  and  $R_4$  are respectively hydrogen or a linear, cyclic, or branched perfluoroalkyl group of 1 to 20 carbon atoms, at least one of  $R_3$  and  $R_4$  being not hydrogen, and one or more of  $\text{CF}_2$  of the perfluoroalkyl group may be replaced by  $\text{CH}_2$ , O, CO, S, or NH.

2. A  $\pi$ -conjugated compound represented by any of General Formulas (III) to (VII) below;



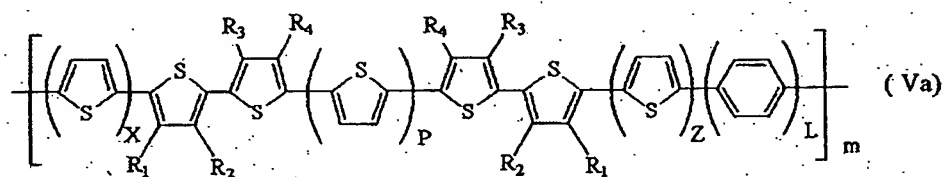
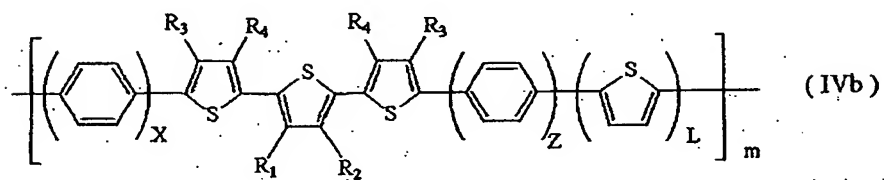
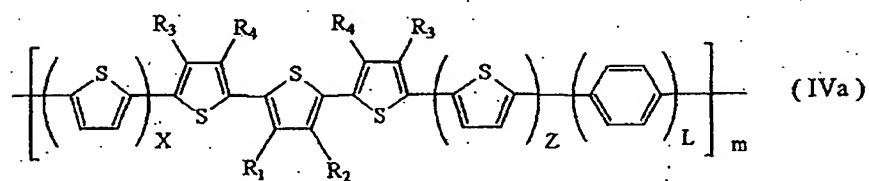
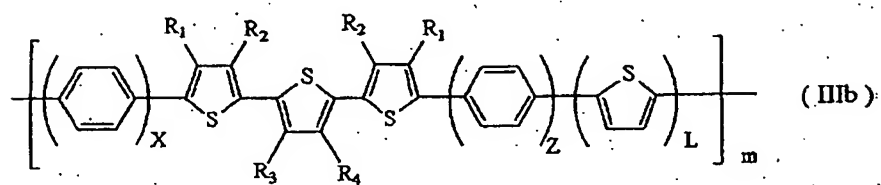
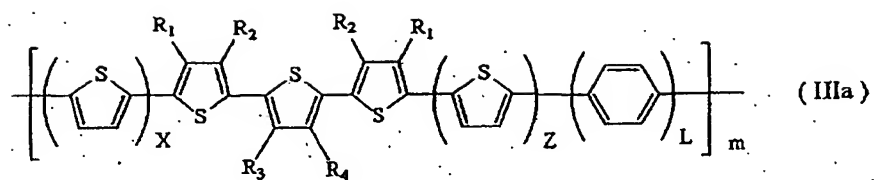
(III)

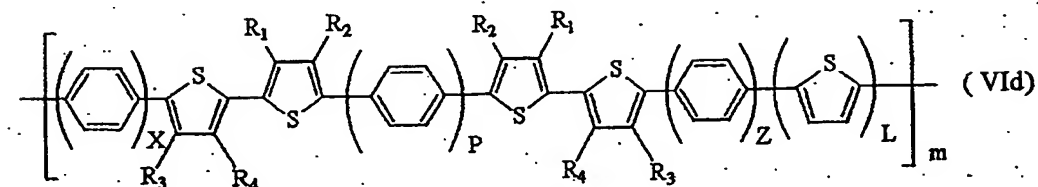
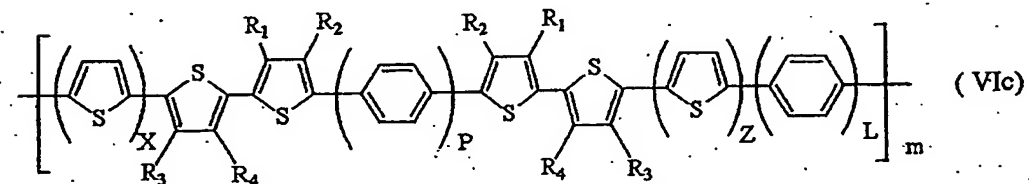
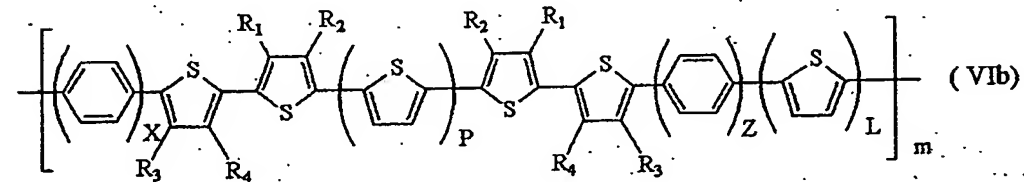
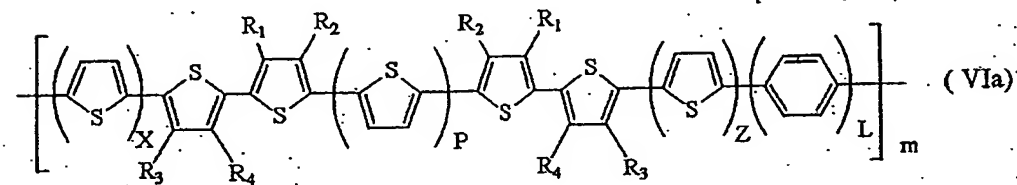
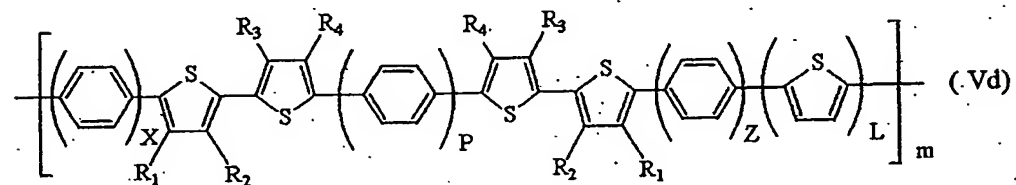
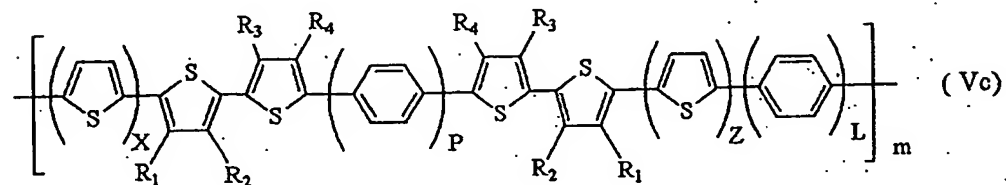
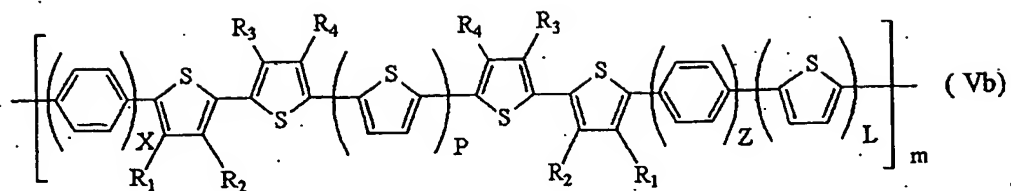


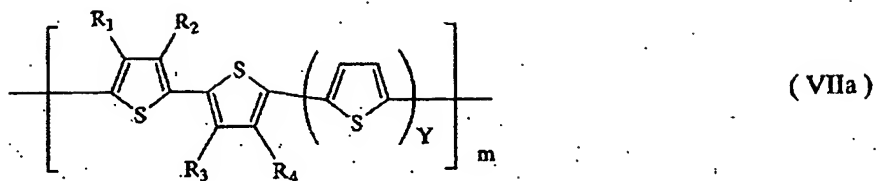
- 5 where  $R_1$  and  $R_2$  are respectively hydrogen or a linear, cyclic, or branched alkyl group of 1 to 20 carbon atoms, at least one of  $R_1$  and  $R_2$  being not hydrogen, and one or more of  $\text{CH}_2$  of the alkyl group may be replaced by O, CO, S, or NH;  $R_3$  and  $R_4$  are
- 10 respectively hydrogen or a linear, cyclic, or branched perfluoroalkyl group of 1 to 20 carbon atoms, at least one of  $R_3$  and  $R_4$  being not hydrogen, and one or more of  $\text{CF}_2$  of the perfluoroalkyl group may be replaced by  $\text{CH}_2$ , O, CO, S, or NH;  $A_1$ ,  $A_2$ ,  $A_3$ , and  $A_4$

represent respectively a linkage selected independently from the group consisting of a single bond, an alkylene group of 1 to 10 carbon atoms, a  $-(CH=CH)_r-$  group, and bivalent ring groups of thiophene, furan, benzene, anthracene, and pentacene; one or more of CH groups in the ring may be replaced by N, or may have a substituent; r is an integer of 1 to 10; X, Z, and L are respectively an integer of 0 to 20 provided that the sum  $X+Z+L$  is an odd number; Y is an even number of not more than 20; P is an odd number not more than 19; and m is an integer of 2 or more.

3. A  $\pi$ -conjugated compound represented by any of General Formulas (IIIa) to (VIIa) below;







where  $R_1$  and  $R_2$  are respectively hydrogen or a linear, cyclic, or branched alkyl group of 1 to 20 carbon atoms, at least one of  $R_1$  and  $R_2$  being not hydrogen, and one or more of  $CH_2$  of the alkyl group may be replaced by O, CO, S, or NH;  $R_3$  and  $R_4$  are respectively hydrogen or a linear, cyclic, or branched perfluoroalkyl group of 1 to 20 carbon atoms, at least one of  $R_1$  and  $R_2$  being not hydrogen, and one or more of  $CF_2$  of the perfluoroalkyl group may be replaced by  $CH_2$ , O, CO, S, or NH; X, Z, and L are respectively an integer of 0 to 20 provided that the sum  $X+Z+L$  is an odd number; Y is an even number of not more than 20; P is an odd number not more than 19; and m is an integer of 2 or more.

4. The  $\pi$ -conjugated compound according to claim 2 or 3, wherein X, Z, and L are respectively an integer of 0 to 6, Y is an even number of 6 or less, and P is an odd number of 5 or less.

5. The  $\pi$ -conjugated compound according to any of claims 1 to 3, wherein m is an integer of 2 to 500.

6. A conductive organic thin film containing the  $\pi$ -conjugated compound set forth in any of claims

1 to 3.

7. A conductive organic thin film, containing an organic compound, wherein the organic compound has, in the molecule, group or skeleton moieties capable of causing at least three kinds of intermolecular interactions, and the conductive organic thin film is constructed to have an ordered structure by alignment of the group or skeleton moieties between the molecules.

8. The conductive organic thin film according to claim 7, wherein the intermolecular interactions includes a  $\pi$ - $\pi$  interaction, an alkyl interaction, and a perfluoroalkyl interaction.

9. The conductive organic thin film according to claim 7 or 8, wherein the organic compound is aligned in the film.

10. A field effect type organic transistor, constituted of three electrodes of a source electrode, a drain electrode, and a gate electrode, a gate insulating layer, and an organic semiconductor layer, wherein the organic semiconductor layer is a conductive organic thin film set forth in claim 9.

11. The field effect type organic transistor according to claim 10, wherein molecules of the  $\pi$ -conjugated compound have respectively a long molecular axis aligned parallel to the direction of the source electrode and the drain electrode.

12. The field effect type organic transistor according to claim 10, wherein molecules of the  $\pi$ -conjugated compound have respectively a long molecular axes aligned perpendicularly to the direction of the source electrode and the drain electrode.

13. A field effect type organic transistor, constituted of three electrodes of a source electrode, a drain electrode, and a gate electrode, a gate insulating layer, and an organic semiconductor layer, wherein the organic semiconductor layer is a conductive organic thin film set forth in claim 8.

14. The field effect type organic transistor according to claim 13, wherein molecules of the  $\pi$ -conjugated compound have respectively a long molecular axis aligned parallel to the direction of the source electrode and the drain electrode.

15. The field effect type organic transistor according to claim 13, wherein molecules of the  $\pi$ -conjugated compound have respectively a long molecular axes aligned perpendicularly to the direction of the source electrode and the drain electrode.

16. A field effect type organic transistor, constituted of three electrodes of a source electrode, a drain electrode, and a gate electrode, a gate insulating layer, and an organic semiconductor layer,



wherein the organic semiconductor layer is a conductive organic thin film set forth in claim 7.

17. The field effect type organic transistor according to claim 16, wherein molecules of the  $\pi$ -conjugated compound have respectively a long molecular axis aligned parallel to the direction of the source electrode and the drain electrode.

18. The field effect type organic transistor according to claim 16, wherein molecules of the  $\pi$ -conjugated compound have respectively a long molecular axes aligned perpendicularly to the direction of the source electrode and the drain electrode.